USING SCIENCE FOR/IN DIPLOMACY
FOR ADDRESSING GLOBAL CHALLENGES

S4D4C EUROPEAN SCIENCE DIPLOMACY ONLINE COURSE

MODULE 5

Which thematic and regional approaches of science diplomacy exist?

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Practical information

- This module takes a minimum of **3 hours**
- A PDF version of the module is available here: LINK

How to cite this module

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S4D4C EUROPEAN SCIENCE DIPLOMACY ONLINE COURSE MODULE 5 – Which thematic and regional approaches of science diplomacy exist?

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5.1 Approaches to science diplomacy – introduction to the module

This module is a walk through the science diplomacy strategies in different countries and regions around the world.

Furthermore we will explain how different countries and organisations face some of the biggest global challenges and delineate the science diplomacy (SD) strategies that are related to the corresponding national or regional initiatives (climate change, food sustainability, pandemics, etc.).

Finally we draw some conclusions on how to identify, plan and facilitate SD actions.

5.1.1 Learning Objectives and Preliminary Experts' Insights

Learning objectives

After successful completion of this module, you will be able to:

- describe and differentiate a number of regional and national approaches to science diplomacy
- name and describe some important approaches to challenging global topics (e.g. water, health)
- design a basic approach towards building a strategy in science diplomacy

Please be aware that the examples that are given in this module are just a selection of what can be found in the real world. They are, therefore, illustrative, but not comprehensive and should be augmented by the experiences in the course of your own development.

What the experts think

We have invited a group of experts to give us some preliminary insights about the question "Which national, regional and thematic approaches of science diplomacy exist?" Their explanations will help to establish the foundations on which we will build up your knowledge.

<table>
<tr><td rowspan="2">  </td><td>Martina Hartl
Austrian Ministry of Education, Research and Science and rapporteur of the Science Diplomacy Force of the Strategic Forum on International Cooperation (SFIC).</td></tr>
<tr><td>How Europe collaborates with other regions in the world?
Video Link to YouTube
What are the "strategic", "operational" and "support" tools for EU science diplomacy?
Video Link to YouTube</td></tr>
</table>

	**Miguel García-Herráiz Roobaert** Deputy Directorate General for EU External Relations and Trade, Secretariat of State for EU Affairs, Spanish Ministry for Foreign Affairs, European Union, and Cooperation
	What is the Union for the Mediterranean? How does it relate to science diplomacy? Video Link to YouTube
	**Tiina Vihma-Purovaara** Senior Ministerial Adviser, Ministry of Education, Science and Culture, Finland
	How do you see the approach to science diplomacy (personally, in Finland, in Europe)? Video Link to YouTube
	**Pierre Bruno Ruffini** Professor, University of Le Havre
	How do member States of the European Union relate to science diplomacy? Video Link to YouTube

5.1.2 Structure and content of the module

The module is composed of **three major chapters**:

1. an introduction to regional and national approaches to science diplomacy based on some historical facts, national institutional frameworks and selected spotlights on current trends;
2. examples for the handling of global challenges, where both aspects of science diplomacy, science *and* diplomacy, are actually needed and can be combined in prolific ways;
3. summary – characteristics of science diplomacy action

You may find it helpful to recur to module 4 "Science Diplomacy practices of the EU" as an example for a particular regional approach to science diplomacy. Reference to other modules might be useful as well, as they introduce the cultural dimension of science diplomacy.

5.2 Regional and national science diplomacy strategies

National, regional or thematic approaches to science diplomacy can be identified by scrutinizing documents from national and international diplomatic contexts in which

diplomacy meets science and vice versa. You may find policy guidelines or even just short sections that point to a specific understanding of science diplomacy. One may suppose that such an understanding has a **political underpinning**, which was set in a country's foreign policy deployment and which is now implemented by its diplomats. The following paragraphs will mainly focus on this approach, by interpreting science diplomacy strategies as representations of national – or regional – policy making.

However, a specific approach to science diplomacy is not only expressed in the official announcements of public diplomacy. It is also reflected in the **behaviour of diplomats** and, where it may have happened to you already as well, of scientists who interact with one another. We could therefore base our political understanding of science diplomacy on a perspective that goes hand in hand with the attention we pay to the individual behaviour of statesmen and scientists. It quickly becomes clear that the communicative style of an individual is not only and necessarily based on a certain selected political strategy. In some situations, **personal and socio-cultural factors** may also have a considerable influence. Peter Ester and Pieter van Nispen analyse in their paper "Foreign Policy and the Cultural Factor: A Research and Education Agenda" (2013) different socio-cultural dimensions. Two of them are collectivism (loyal integration of individuals in primary groups, which offer protection throughout life) and individualism (society with relatively loose mutual ties and in which individuals are expected to take care of oneself and their immediate family). According to this study individualism is most pronounced in EU-countries such as Great Britain, the Netherlands, France, and Italy and is least emphasized in Egypt, Morocco, Portugal, Serbia, and Romania. These cultural differences may lead to **variant behaviour in negotiations**, for example, where a member of an "individualist" culture shows more interest in strengthening his or her own position than in finding compromises. The dimension can as well manifest in the attention that is paid to either the relationship between persons or the matters that are discussed. We will have to neglect the discussion of these factors here. The case shows us, however, a need to respect such differences in fields of international relations, foreign policy, and diplomacy. For more information on this, please look again at the individual experiences of our experts (videos), and on chapter 6.3 Skills in practice, in which communication and negotiation skills are described.

The national, regional, and thematic access to science diplomacy is marked by current political dynamics, interests, and sometimes, of course, by tensions. Against this background, it is important to look at current situations and to recognize and use the **strategic possibilities of science diplomacy**. In addition, historical and cultural contexts can play an extremely important role. The historical and cultural dynamics of global diplomatic relations and the role that science plays in them are complex. However, the better you understand it, the more useful science diplomacy can be.

Due to the different strategic approaches we have chosen three European (Germany, France and Spain) and three non-EU countries (China, Japan and USA): They are leading in science, technology and innovation, but they have different cultural identities and political as well as scientific structures. As regards science diplomacy, all of them follow more or less explicit strategies, while China is following a more implicit line. Therefore and in sum, this selection gives us the chance to present a comprehensive overview. Please have a look at the specification of the similarities and differences that we describe

in the following sections. For more detailed information, please feel free to check the information in the "Read more" boxes.

5.2.1 China

Historically, the export of Chinese scientific knowledge to the rest of the world is a fundamental part of Chinese cultural identity. After the time of European enlightenment and the emergence of modern science, however, the roles changed. In recent times, China participated in the scientific innovations of the western world in particular by exchanging knowledge among scientists and by sending visiting students to western universities. In the **course of economic liberalization**, the Confucius Institutes were founded in 2004 with the aim of promoting cultural and scientific exchange. Interestingly enough, they are often situated at a university campus (unlike, for example, the German Goethe-Institute or the Institut Français). However, an ideological undertone is regularly attributed to them and they do not always achieve the intended reputation.

On March 28, 2015, President Xi Jingping outlined China's ambitious "**One Belt, One Road**" vision during his remarks at the Boao Forum for Asia. This project "covers over half of the global population and involves more than 60 countries along the routes, the economic aggregates of which account for about one-third of the world" (Zheng Yongnian and Zhang Chi, 2018). According to the head of the scientific component of the project, "Science, technology and innovation are the core driving force for the BRI (Belt and Road Initiative) development" (Masood, 2019). In the framework of the president's project, the University Alliance of the Silk Road (UASR) was founded as a non-governmental and non-profit organization. The self-declared goal is to "advance institutional exchanges and partnerships on the Silk Road routes in regards to talent education, scientific research, cultural dissemination, policy studies, and medical service etc." (UASR, n.d.). The Chinese investment in the construction of modern infrastructure along the road, e.g. at the frontier to Kazakhstan, may be interpreted as an example of technological export and an argument for diplomatic interchange. The medium- and long-term impact of China's "One Belt, One Road" vision remains unclear. The degree, however, to which the BRI incorporates science diplomacy may be taken as an indicator of how far it has become a coherent policy framework and actually incorporated into policy practice (Freeman 2019).

Ingrid d'Hooghe

Lecturer, Leiden University

Senior Research Fellow, LeidenAsiaCentre

China's BRI Education and Science Diplomacy

Video Link to YouTube

Over the past two decades, China's importance for the **development of modern sciences and future technologies** has increased significantly. Chinese scientific publications have caught up with the world's leading publications and even outperformed some of them. Science is thus readily available as a tool for soft power in diplomacy. Chinese diplomacy demands communication on equal terms with leading industrial nations. At the same time, the government uses its new scientific-technological position

and the growing economic power in its interaction with trusted partners (such as the BRICS states) as guiding principles.

Science diplomacy is seen by the Chinese as an important instrument: "Promoting science diplomacy is a **major part of the nation's overall diplomatic work**, and makes a contribution to major power diplomacy with Chinese characteristics" (MoST 2017, cited by Freeman 2019, 7). Science diplomacy, as Freeman (2019) shows in an analysis of Chinese basic political texts from the MoST among others, does not play a clear and consistent role in the orientation of the Chinese strategy. Rather, it is an instrument alongside others, especially economic ones, and is used selectively and sporadically. At least it appears that Chinese science diplomacy is not based on a fixed framework.

Read more about China´s development in the reference below:

- Elsevier (n.d.), The One Belt, One Road Initiative's Potential Impact on Global Research Collaboration, https://www.elsevier.com/research-intelligence/campaigns/onebeltoneroad (accessed, 25 March 2020)
- Freeman, D. (2019): China and Science Diplomacy: An Emerging or a Marginal Policy? In: European Leadership in Cultural, Science and Innovation Diplomacy (EL-CSID) 2019/17, pp. 1-11. https://www.el-csid.eu/policy-briefs (19.12.2019)
- Ingrid d'Hooghe, Annemarie Montulet, Marijn de Wolff and Frank N. Pieke (2018): Assessing Europe-China Collaboration in Higher Education and Research, https://leidenasiacentre.nl/wp-content/uploads/2018/11/LeidenAsiaCentre-Report-Assessing-Europe-China-Collaboration-in-Higher-Education-and-Research.pdf
- Masood, E. (2019), How China is redrawing the map of world science, https://www.nature.com/immersive/d41586-019-01124-7/index.html (accessed 25 March 2020, published 1 May 2019).
- Zheng Yongnian and Zhang Chi (2018), The Belt and Road Initiative and China's Grand Diplomacy, China and the WorldVol. 01, No. 03, 1850015 (2018) Part One: Journal Articles, https://doi.org/10.1142/S2591729318500153

5.2.2 USA

> *"On science and technology, we will launch a new fund to support technological development in Muslim-majority countries, and to help transfer ideas to the marketplace so they can create more jobs. We'll open centers of scientific excellence in Africa, the Middle East and Southeast Asia, and appoint new science envoys to collaborate on programs that develop new sources of energy, create green jobs, digitize records, clean water, grow new crops."*
>
> Remarks by President Obama, "On a new beginning", Cairo University, Cairo, Egypt, June 4, 2009, https://obamawhitehouse.archives.gov/the-press-office/remarks-president-cairo-university-6-04-09 (19.12.2019)

The US-American understanding of science was and is an important orientation for many states and societies worldwide. An advanced educational model, highly developed science and technology, and liberal traditions of public diplomacy are the essential elements of America's national style in science diplomacy. For a long time there was **broad consensus on the US dominance** in this area. Krasnyak (2018) points out that American science diplomacy was well suited to weakening the very assertive

communicative style of US diplomats under certain circumstances. For instance, during the Cold War, the foreign policy goals of the two superpowers required diplomatic multitasking. Both America and the Soviet Union practiced science diplomacy to achieve the goal of spreading influence in the Third World. Such was the case for vaccine diplomacy. Reinforcing bilateral relations with each other, both adversaries went through at least a decade-long project of space diplomacy. Today, the International Space Station (ISS) is considered a flagship of science diplomacy.

The USA played a **leading role** in the development of science diplomacy. Many of today's standards that apply to the intermeshing of science and diplomacy can be traced back to US initiatives. Since the 1950s, there has been a Science Adviser's Office at the Department of State. Particularly President Obama contributed to the significance of science diplomacy in international politics, when he announced in 2009 a bundle of actions in science and technology cooperation with the Middle East and other regions of the world. Among others, a science attaché's program was initiated in order to establish long-term partnerships built on scientific cooperation and trust.

Science diplomacy is led by several US institutions and is located close to the highest decision making powers in the White House Office of Science and Technology Policy (OSTP). The **American Association for the Advancement of Science (AAAS)** is an important forum where the role of science in international relations and scientific cooperation in foreign policy is enhanced and strengthened. However, critics of President Trump accuse him of neglecting facts that are widely accepted by the scientific community, such as the origins of climate change, in his decision making (NY Times, 2018).

As in other countries, development cooperation and foreign aid play a crucial part in science diplomacy. Critics have lamented the supposedly politicised role of the **US Agency for International Development (USAID)** in the country's foreign policy. Due to its generous funding, American non-governmental institutions, such as the Carnegie Foundation or the Bill Gates Foundation, have a significant impact in the beneficiary countries. They enhance frugal innovation in Africa, for example, and provide funds for scientists who work in international cooperation. Some places in the USA itself have become an important breeding ground for science diplomacy, where other countries establish and maintain diplomatic representations (Ittelson & Mauduit 2019).

The **Trump administration** is currently changing the framework conditions for the appearance of diplomats as well as the role that science plays in diplomacy. The National Security Strategy of the United States of America (December 2017) focuses on the task of making diplomacy more competitive.

On 1 January 2019, the **United States withdrawal from the United Nations Educational, Scientific and Cultural Organization (UNESCO)** took effect. The withdrawal of the USA, together with Israel, was seen as a major setback to one of the most important forum for science diplomacy and continues to challenge the funding of the majority of the agencies' projects.

Read more about the USA in the reference below:

- The National Security Strategy of the United States of America (2017),

https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905.pdf

- A contribution by Olga Krasnyak to the blog of the Centre of Public Diplomacy at the University of Southern California on the science diplomacy strategy of the USA, https://www.uscpublicdiplomacy.org/users/olga_krasnyak
- FAO, IFAD, UNICEF, WFP and WHO. 2018. The State of Food Security and Nutrition in the World 2018. Building climate resilience for food security and nutrition. Rome, FAO, http://www.fao.org/3/i9553en/i9553en.pdf
- Ittelson, Pavlina and Mauduit, Jean-Christophe (2019): Science & Diplomacy. How countries interact with the Boston innovation ecosystem. Msida: DiploFoundation., https://www.diplomacy.edu/sites/default/files/Boston_Science_Diplomacy.pdf (19.12.2019)
- Krasnyak, Olga (2018): National Styles in Science, Diplomacy, and Science Diplomacy. A Case Study of the United Nations Security Council P5 Countries. Leiden/Boston: Brill., https://brill.com/view/title/54474?rskey=2OI4U6&result=1 (19.12.2019)
- NY Times (2018), In the Trump Administration, Science Is Unwelcome. So Is Advice. https://www.nytimes.com/2018/06/09/climate/trump-administration-science.html (accessed 25 March 2020, published 9 June 2018).

Links to institutions:

- White House Office of Science and Technology Policy (OSTP), https://www.whitehouse.gov/ostp/
- American Association for the Advancement of Science (AAAS), sometimes called the "Triple A-S", https://www.aaas.org/

5.2.3 Germany

For several decades, science diplomacy has been an important strategic tool in the context of German international engagements. German science diplomacy is **closely linked with institutions** that have initiated and maintained a particularly high degree of scientific and diplomatic interlocking. Probably you have heard of the DAAD, the German organisation for academic exchange. After the war, for example, there was already a DAAD office in London before the UK established diplomatic relations with Germany. The German Max-Planck Society (MPG) and the Israeli Weizman Institute (WIS) also signed their first "Minerva Agreement" on scientific cooperation in 1964, one year before diplomatic relations between the two states began. Another institution, the Alexander von Humboldt Foundation, had already been founded in the 19th century. The foundation is an important advocate for strengthening global science diplomatic networks and explicitly focuses on science diplomacy. Leopoldina, a scientific academy that was founded in the 17th century, is considered the oldest continuously existing science academy in the world. In 2008, Leopoldina was named the first German National Academy of Sciences. It represents the German scientific community abroad and advises the German government.

Scientific institutions are increasingly embracing the concept of science diplomacy. The German Research Foundation (DFG) adopted the concept in their **guidelines for international action**. The German Helmholtz Association of German Research Centres acknowledges the importance of science diplomacy and named it as one of the central four strategic goals of their internationalisation strategy 2017-2022.

The German government puts increasing emphasis on the role of science in foreign policy. In the 2010s, the first strategic documents that clearly pointed in that direction were published by the German Federal Ministry of Education and Research (BMBF) and the German Federal Foreign Office (AA). In 2017, the Federal Cabinet published the new

Strategy of the Federal Government for the Internationalization of Education, Science and Research. The strategy includes, among other measures, the enhancement and strengthening of international cooperation, the facilitation of knowledge and competencies, and the support of German industries in the markets of future technologies.

There is a strong alignment between this strategy and other national strategies, such as the **national strategy for the cooperation with Africa or China**. The aforementioned institutions are closely linked to the political priorities of the Federal Government, too. The DAAD´s strategy for internationalisation 2015 highlights global cooperation and the exchange of information on advanced technology as important strategic goals. These goals are also key priorities for the "**German House for Science and Innovation**" (Deutsches Wissenschafts- und Innovationshaus – DWIH), an institution that was founded by the German Federal Foreign Office, with subsidiaries in New York, Sao Paulo, Moscow, New Delhi and Tokyo. The DWIH are considered pioneers of German research around the globe, hosting German research agencies and associations like the DAAD and DFG, among others.

Read more about Germany´s approaches in the reference below:

- Schütte, G. (2020), „Science Diplomacy – zwischen Anspruch und Wirklichkeit", DAAD, https://www2.daad.de/der-daad/daad-aktuell/de/75656-science-diplomacy--zwischen-anspruch-und-wirklichkeit-/
- Flink, T. & Schreiterer, U. (2010), Science diplomacy at the intersection of S&T policies and foreign affairs: Toward a typology of national approaches, 37, DO - 10.3152/030234210X12778118264530, - Science and Public Policy, https://www.academia.edu/4031307/Flink_T._Schreiterer_U._2010_Science_diplomacy_at_the_intersection_of_S_and_T_policies_and_foreign_affairs_toward_a_typology_of_national_approaches._In_Science_and_Public_Policy_37_9_pp._665-677

5.2.4 France

French foreign policy and diplomacy are strongly linked to **France's role in global history, in colonial contexts**, but also to a large extent through **cultural diplomatic initiatives**. France's reputation in the world goes hand in hand with a fundamental consensus on the importance of the "Francophonie". After all, French is one of the official languages spoken in various political institutions worldwide and was considered the "language of diplomacy" as of the 17th century until it was increasingly replaced by English.

In this respect, French foreign policy speaks of cultural diplomacy, to which it has recently placed scientific diplomacy on an equal footing. The report of the Ministry of Foreign Affairs on "**Une diplomatie scientifique pour la France**" of 2013 deals with science diplomacy in detail. Politics can and should serve science; science is an advantage for foreign policy in order to pursue France's interests in a soft way. Science diplomacy is seen as an important tool to stimulate development, maintain France's leadership, drive innovation and mobilise the global network for French (and European) interests. In this context, the government aims to increase interaction between **France's scientific community and its diplomatic network** in order to:

- support the status of researchers and companies in international competition,
- involve the science world more closely with foreign policy objectives, and in particular,
- raise researchers' awareness in development issues, by building and leveraging the Global South's scientific capabilities.

The **French Académie des Sciences** is a leading actor in policy advice with relation to these matters.

France's policy vis-à-vis **large-scale research infrastructures** is also an essential component of the effort to enhance the country's influence abroad and a good example for science diplomacy. For over fifty years, the country invested in developing major physics and astronomy research facilities and, very recently, data bases, libraries and shared scientific computing networks, like GANIL (National Large Heavy Ion Accelerator) at the national level. Other multilateral examples include the European Organisation for Nuclear Research (CERN) and European Southern Observatory (ESO) at the European level, or the International Thermonuclear Experimental Reactor (ITER) and Atacama Large Millimetre Array (ALMA) at the global level. The hosting of major research instruments in France contributes to establishing itself as a hub for international scientific elites and provides opportunities to boost academic but also diplomatic cooperation.

The Ministry for Europe and Foreign Affairs dedicates a special section of its website to the concept of science diplomacy. Accordingly, "the Ministry for Europe and Foreign Affairs works at interministerial level, in close cooperation with the Ministry of Higher Education and Research (MESR), to ensure the consistency of France's action, and devotes all the resources of its diplomatic network to enhancing France's attractiveness."

What the experts think

<table>
<tr><td rowspan="2">  </td><td>Minh-Hà Pham
Vice-President for International Relations, Université Paris Sciences et Lettres – PSL (PSL)</td></tr>
<tr><td>Could you explain briefly the science diplomacy approach in France?
Video Link to YouTube</td></tr>
</table>

Read more about France´s science diplomacy in the reference below:

- Ministry for Europe and Foreign Affairs (n.d.), Scientific Diplomacy, https://www.diplomatie.gouv.fr/en/french-foreign-policy/scientific-diplomacy/
- Report "Science Diplomacy for France" (2013), https://www.diplomatie.gouv.fr/IMG/pdf/science-diplomacy-for-france-2013_cle83c9d2.pdf

5.2.5 Japan

Since Japan has been **one of the leading countries in science, technology and innovation** for many decades, a closer look at its science diplomacy strategy might be

worthwhile. The Prime Minister's Cabinet Office's Council for Science and Technology Policy (CSTP) published the report "Toward the reinforcement of Science and Technology Diplomacy" in 2008 that described a clear link between science and technology and foreign policy and pleaded for mutual development. It insists that Japan's science diplomacy place importance on strengthening (Atsushi Sunami, Tomoko Hamachi, and Shigeru Kitaba, 2013):

1. S&T cooperation with developing countries for resolving global issues,
2. S&T cooperation using Japan's advanced S&T, and
3. the basis for promoting S&T diplomacy.

In 2011, the Japanese government released the 24th five-year national strategy on science, technology and innovation. Here, science diplomacy is mentioned as a task of strategic national significance. The strategy clearly points at using science diplomacy as a tool for strengthening Japan's international competitiveness.

In 2015, the first **science adviser** to the minister of foreign affairs was appointed. In the same year, the Japanese government published various policies with direct connection to science diplomacy. On 16 October 2015, Japan's Prime Minister, Shinzo Abe, adopted a national Arctic policy with unanimous support from his cabinet ministers. It declared Japan´s intention to address the negative impacts of environmental change by leveraging its strengths to enhance cross-border scientific and technological cooperation (i.e., science and technology diplomacy) and to incorporate the outcomes into design and implementation of national policy and international rule making.

Apart from the contribution that science diplomacy makes to international relations and agreements, particularly with neighbours in the Asian region, but as well with partners in the whole world, science diplomacy is planned with a clear differentiation of potential partners. Science diplomacy is intended to support research with developing countries to find solutions for global challenges. In this context, Japan has been increasingly demonstrating its willingness to open up its scientific programs to foreign partners and to sponsor genuinely collaborative partnerships with developing countries. Furthermore, science diplomacy serves research cooperation with technologically advanced countries for joint efforts in developing future technologies. In line with this government policy, the Japan Science and Technology Agency (JST) has implemented a research exchange program known as the Strategic International Cooperative Program (SICP) since 2003. The main policy lines in science diplomacy of the Japanese government had an effect on other ministries, which have each published their own science diplomacy strategies.

Read more about Japan´s science diplomacy here:

- Sunami, A. (2016), Japan's Science and Technology Diplomacy, https://carnegieendowment.org/2016/02/10/japan-s-science-and-technology-diplomacy-pub-63476 (accessed 25 March 2020, published 10 February 2016)
- Ministry of Foreign Affairs of Japan (n.d.), Global Issues & ODA- Science and Technology, https://www.mofa.go.jp/policy/s_tech/index.html
- Atsushi Sunami, Tomoko Hamachi, and Shigeru Kitaba, "The Rise of Science and Technology Diplomacy in Japan," Science & Diplomacy, Vol. 2, No. 1 (March 2013*). http://www.sciencediplomacy.org/article/2013/rise-science-and-technology-diplomacy-in-japan
- Yoko Kamikawa and Tomoko Hamachi, Japan's Evolving Efforts toward Sustainable Development of the Arctic, http://www.sciencediplomacy.org/perspective/2016/japans-evolving-efforts-toward-

sustainable-development-arctic (September 2016)

5.2.6 Spain

In its **Report on Science, Technology and Innovation Diplomacy (STID)** of 2016, the Spanish government emphasizes that science, technology, and innovation plays an important role in the development of fruitful and sustainable cooperation between countries. Accordingly, the capacity to produce scientific and technological innovation is a necessary and preliminary condition to achieve the goals of the Agenda 2030 of the UN. Moreover, the government points out that science, technology, and innovation is an important means to attract talent to the country, promote collaboration, and create the framework for competitive industries. Against this background, STID becomes an important soft power to build international relations and – an aspect that the Spanish government frequently mentions in this report – an instrument to create a positive image of the country as a whole.

The approach of the Spanish government towards science diplomacy relies to a high degree on the institutions that are involved. The governmental report refers to both the diplomatic and scientific organisations, associations, agencies, among others. Elorza et al. (2017), who give an overview of last years' developments of science diplomacy in Spain, offer an analysis of the layout and the results of the approach and its efforts, calling it a "**bottom-up, multi-stakeholder approach**". The Spanish science diplomacy network (comprising different departments of Spanish Embassies abroad, scientific and innovation representatives of the Ministry of Science and Innovation abroad, among others) has established a fluid dialogue with civil society and researchers associations as it aims to become open and receptive to the needs of society and the research community.

The Ministry of Science and Innovation, through the Spanish Foundation for Science and Technology (FECYT), and in coordination with the Ministry of Foreign Affairs has run a pioneer pilot in which three scientific coordinators were deployed to the Embassies of Spain in Washington DC, London and Berlin. The pilot, finished in 2018, helped dynamising the Spanish science diplomacy network. As for today, the network meets in Madrid on a yearly basis and keeps fluid communication among countries, institutions and different stakeholders.

What the experts think

Cristina Fraile

Deputy Chief of Mission at the Embassy of Spain in Washington

How do you think science diplomacy can contribute to reinforce Spanish diplomacy?

Video Link to YouTube

Read more about Spain´s science diplomacy in the reference below:

- Elorza Moreno, Ana/Melchor, Lorenzo/Orts-Gil, Guillermo/Gracia, Cristina/Lacunza, Izaskun/Izquierdo,

Borja/Fernández-Vera, José Ignacio (2017): Spanish Science Diplomacy: A Global and Collaborative Bottom-Up Approach. In: Science & Diplomacy 6(1), http://www.sciencediplomacy.org/files/spanish_science_diplomacy_science__diplomacy.pdf (02.01.2020)

- Government of Spain (2016): Report on Science, Technology and Innovation Diplomacy, http://www.ciencia.gob.es/stfls/MICINN/Investigacion/FICHEROS/Informe_diplomacia_cientifica_Version-ingles.pdf (02.01.2020)

5.3 Science diplomacy strategies for global challenges

When the Summit of the United Nations adopted the **Agenda 2030** in 2015, the international community clearly expressed the conviction that the major global challenges can only be solved with joint actions. Many of our contemporary global problems need scientific analysis through the dedicated work of experts; solutions can only be found by border-crossing and coordinated cooperation. Science diplomacy is crucial for a policy making that opens the doors for these joint efforts.

Apart from the effects that can be observed on the level of international cooperation, one can assume that national policies will be affected by joint actions, too. Science diplomacy strategies can have a **positive impact on the internationalisation** of institutions in the area of science and technology. Additionally, the way countries pursue their own national interests will impact the shape and characteristics of the joint initiatives that are undertaken in order to face global challenges. For example, the effects of rising global temperatures due to climate change will be felt by us all. In this context, efforts on the level of international policy already date back decades with varying degrees of success. And we are convinced that effects on (sub-)national levels will become more and more visible in the future.

Science cooperation is a **powerful instrument to build trust and to pursue common goals in diplomacy**:

> *"Diplomats need practices that enable them to bring together and reconcile the increasing variety of interests, which they can achieve, for example through science advisors or science advice mechanisms. This is a precondition if they want to realise collective action that addresses grand societal challenges."*
>
> (Policy brief: Towards effective science diplomacy practice, Premise #3, Page: 8)

The provision of safe nutrition and health, the reduction of poverty, the preservation of our environment, and the exploration of space can only be achieved by joint action. In some cases, science cooperation leads to beneficial effects for entire regions. A remarkable example can be seen in the development of the Tsunami Warning System in the Pacific. The coordination of its installation was done by an international group. The UNESCO established an Intergovernmental Oceanographic Commission to this end. The UN will provide a framework for more international cooperation in this area of disaster risk reduction by proclaiming the Decade of Ocean Science for Sustainable Development (2021-2030).

5.3.1 Food and nutrition security

One of the **UN Sustainable Development Goals**, SDG 2, addresses the urgent need to achieve food and nutrition security ("Zero Hunger"). Although some progress in this regard was reported by international agencies in the last years, there is no reason to believe that the challenge already has been overcome yet. In its report of 2018, "The State of Food Security and Nutrition in the World", the Food and Agriculture Organization of the United Nations (UN FAO) indicated that international food security has decreased and that the proportion of people suffering from malnutrition has increased.

There are a number of influencing factors in the processes that decide whether nutritional safety and improved nutrition can be achieved in the short or long term. These include climate change, water scarcity, poverty, and even oil and gas prices, since the production of fertilizers, for example, is oil dependent. However, there are also great economic differences in the conditions prevailing in agriculture worldwide. In less developed regions, for example, such as the sub-Saharan and some Asian areas, food is mainly produced by small farms. In industrialized countries such as the USA or Canada it is rather large farms that generate food. The challenges that this ecosystem is facing differ significantly. The **Network of African Science Academies (NASAC)** has recently pointed out that virtually all components of the nutritional system depend on innovation. Planting material should be affordable and accessible, soil and water have to be controlled in terms of quantity and quality, waste should be avoided. For African food systems, innovations, i.e. R&D of products/services specifically developed for local circumstances, seem to be a key element of success.

Science has to guide these processes and science diplomacy can provide the paths for international cooperation with regard to these matters. NASAC, for example, is the African chapter of the InterAcademy Partnership (IAP), **a global network of science academies**. The IAP entails over 130 scientific academies that work together in four regional networks. The IAP helps to find adequate policies, improve public health and enhance education. Food and nutrition security and agriculture are some of its focuses. From the identifying of needs and knowledge gaps, the IAP project moves to the formulation of an effective agenda and on actions. With a working group in each of the four regions, further evidence at the regional and the national level is collected, existing priorities and initiatives are consulted. The results lead to the preparation of regional reports that are presented to key policymaking bodies.

On various occasions, the EU expressed its **strong commitment** to enhancing food security in Africa. The cooperation of the EU with representatives of the African Union and its member states has led to a number of bilateral agreements, where related matters are addressed. In the current work programme of Horizon 2020, you can find a section that is dedicated to "Support to the Implementation of the EU-Africa Partnership on Food and Nutrition Security and Sustainable Agriculture". Here, the linkage between a foreign policy objective and a scientific approach becomes explicit.

Read more about food and nutrition security in the reference below:

- The 2018 Report of the FAO on the state of food security and nutrition in the world, http://www.fao.org/3/i9553en/i9553en.pdf
- An article on new models for science diplomacy transcending boundaries, by Claudia Canales Holzeis

and others, http://www.sciencediplomacy.org/article/2019/new-models-for-science-diplomacy-transcending-boundaries

- The growing importance of science diplomacy in the world of diplomacy, by Nikhil Seth, http://www.sciencediplomacy.org/perspective/2019/changing-face-diplomacy-and-enhanced-role-science-diplomacy-in-post-2015-world

5.3.2 Water

Water diplomacy is a relatively new field of interest in international relations and foreign policy strategy building. The significance of water, however, is increasing rapidly. Water is a resource that is related to multifaceted issues. When we discuss the challenges that are related to food and nutrition, actually, water (water quality, irrigation, scarcity of water, etc.) is **one of the biggest influential factors**. When we talk about climate change, water is one of the most threatening aspects to peoples living in low-lying areas all over the globe (salination of river deltas, floodings, etc.). In view of the variety of aspects that are linked to water, it is no surprise that water diplomacy is far from being a homogeneous field.

Since water is a **resource of extremely high importance**, mankind has always organised access to water in some way. Due to the ongoing industrialisation and its impact to the environment, different scientific disciplines, such as hydrology, physics, ecology, and the social sciences, have more and more become interested in the water environment. Interdisciplinary approaches to water management, for example, in the case of water dam construction, polder landscapes, river basin and coastal zone management, have increased in number. Although some segments of water management are prone to be privatised, water is a public good and policy bodies are busy with its maintenance and care. Since water is a topic for border-crossing concerns, it is a diplomatic issue.

In the 1960s, for example, it was the support of the Americans in the person of President L. B. Johnson who gave his support to the Israeli planning of drinking water through desalination. In a speech on June 1, 1964, during the visit of the then Israeli Prime Minister Eshkol to Washington, President Johnson declared:

"Mr. Prime Minister, you told me only this morning that water was blood for Israel. So we shall make a joint attack on Israel's water shortage through the highly promising technique of desalting. Indeed, let us hope that this technique will bring benefit to all of the peoples of the parched Middle East."

President Johnson showed his willingness to cooperate in the development of the desalination technology, and, later, approved funding for the project. It was linked, however, to the hope that a benefit to all people in the Middle East would be generated. Nowadays, the supply of water in the Middle East remains an issue of political tensions.

On 19 November 2018, the European Council adopted **conclusions on water diplomacy** which lay out the strategic framework and the policy objectives and priorities of the EU on water diplomacy (Cf. European Council 2018). The conclusions are divided into five chapters that give us a neat idea of the priorities that are set by the Council of the European Union with regard to water diplomacy

1) Principles (Introduction),
2) Water and security, stability and conflict prevention,
3) Transboundary water cooperation, institutions and governance,
4) Leaving no one behind – water in the 2030 agenda, the Paris agreement on climate change: working multilaterally,
5) Moving to enhanced action.

The conclusions put emphasis on the role that water plays in crises and of the interplay between water scarcity and peace in specific regions. The Council also emphasizes the expertise available in the EU on the issue and its full commitment to ensure that it remains a common good. To this end, a multilateral approach is considered necessary.

Read more!

- European Council (2018): Water diplomacy: Council adopts conclusions. Press release., https://www.consilium.europa.eu/en/press/press-releases/2018/11/19/water-diplomacy-council-adopts-conclusions/
- Foreign Relations, 1964–1968, Volume VolumeXXXIV, Energy Diplomacy and Global Issues, https://history.state.gov/historicaldocuments/frus1964-68v34/d130

5.3.3 Health

Health diplomacy has become more and more important in the last decades. Many countries and organisations share the idea of bringing together disciplines like public health, international affairs, management, law, and economics for a common goal for the good of the people. But this is not an easy task. National interests, medical patent rights, intellectual property protection, pharmaceutical industry groups, non-governmental organisations and various other stakeholders each play an important role in the development of global health diplomacy. Health diplomacy is needed for the negotiations that shape and manage the global policy environment for health. The **relationship between health, foreign policy and trade** is at the cutting edge of global health diplomacy. Health diplomacy and science diplomacy are closely related and have overlapping fields of political and scientific work and interests.

The **World Health Organization (WHO)** has a special unit dealing with health diplomacy (cf. WHO 2019). The goals of this unit are:

1. To support the development of a more systematic and pro-active approach to identify and understand key current and future changes impacting global public health
2. To build capacity among Member States to support the necessary collective action to take advantage of opportunities and mitigate the risks for health (WHO 2019)

Many countries express the immediate political will to make a difference for the benefit of all people's health. In the **Oslo Declaration of 2006**, for example, the Ministers of Foreign Affairs of Brazil, France, Indonesia, Norway, Senegal, South Africa, and Thailand issued a statement, emphasizing that health is one of the most important, "still broadly neglected, long-term foreign policy issues of our time" (Oslo Declaration 2006). Similarly, many states express the immediate political will to make a difference for the good of all people's health. Health is described as a **global public good (GPG)** that needs to be

achieved and maintained at a global level. Although there is progress in various fields, there is still a need to agree to the facilitating and the use of the necessary resources on one side and a lack of coordination and management of processes on the other side.

An international platform for the development of health diplomacy and for the enhancement of health as a GPG might help. In 2013, the **Swiss Academy of Medical Sciences** formulated some of the key points for the establishment of an international platform for health diplomacy. They call it the "5 C's" (Swiss Academy of Medical Sciences 2013):

1. Common norms and norms for investments
2. Communication mechanisms for information sharing and collaboration
3. Coordination mechanisms so that science, research and development investors have better information
4. Collaborating more efficiently
5. Collective decisions for big issues

Providing the necessary conditions to make these framework conditions possible and to implement an international initiative will certainly require a lot of effort. Nevertheless, there are also initial successes of international health diplomacy. One example is the fight against the **Zika virus** in a concerted initiative of several American states. The outbreak of Zika in Brazil and Colombia (2015-2016) led to an international epidemiological alert for infection issued by the WHO and the Pan American Health Organization (PAHO). Different institutions, e.g. the U.S. Center of Disease Control (CDC) and the *Instituto Nacional de Salud* of Colombia (INS), signed a memorandum of understanding to collaborate in an investigation on the long-term effects of Zika virus (CDC 2016).

Great hope for the longer-term achievement of the goals and sub-goals of SDG 3 currently also lies in the future development of the health-related science, technology, and innovation. **Digital technology** makes it possible to compensate for the insufficient doctor-patient relationship insofar technology allows us to reach out to people in inaccessible areas. E-health also facilitates the diagnosis, monitoring, and treatment of pandemic diseases. More recent research, in turn, is leading to the production of affordable medicines, including generics. Science will therefore be able to make an important contribution to the development of health diplomacy, as it already has, and help improve the GPG health.

A current example offers the **Coronavirus crisis**: It shows us how fragile and sensitive our living environments are. "All countries are turning to science. ", is stated in the UNESCO dialogue of March 30th, 2020, because political decision-makers everywhere now seem to trust in scientific expertise more than ever. Science Diplomacy is best suited to support the international efforts for a transition towards Open Science:

- It began with the publication of the genetic sequence of COVID-19 by Chinese scientists in early January 2020 via GenBank – an open access DNA database operated by the US National Center for Biotechnology Information.
- Not yet peer-reviewed results are shared with the research community via bioRxiv and medRxiv and via COVID-19 SARS-CoV-2 preprints, which can immediately be reviewed and tested by the research community.

- Datasets such as CORD-19, literature trackers such as LitCovid or the Outbreak Science Rapid PREreview provide access to current activities.

In this context, the Coronavirus crisis has shown that we have:

- to recognise that the creation and transfer of scientific knowledge are critical to building and sustaining socio-economic welfare and integration in the global economy;
- to support the international scientific community to further demonstrate the spirit and principles of solidarity and knowledge sharing;
- to mobilise policy makers, civil society and private sector and patent holders to further collaborate with scientists to share scientific information.

The use of scientific collaborations among nations to address common problems and to build constructive international partnerships is the main definition of science diplomacy (see 2.2.2 The Royal Society and AAAS's Conceptual Framework: science for diplomacy).

What the experts think

Fernando Simón

Director of the Spanish Coordinating Centre for Health Alerts and Emergencies at the Ministry of Health, Social Services and Equality

Can science diplomacy help prevent and solve health emergencies?

Video Link to YouTube

How does the Spanish health system communicate with other national systems to work together on health issues?

Video Link to YouTube

Read more!

- CDC Center for Disease Control and Prevention (2016): CDC and the Instituto Nacional de Salud of Colombia collaborate to understand long-term effects of Zika virus infection during pregnancy. Press Release, https://www.cdc.gov/media/releases/2016/p0902-cdc-colombia-collaboration.html (19.12.2019)
- Swiss Academy of Medical Sciences (2013): Health Diplomacy Meets Science Diplomacy. Symposium Report, Geneva, 12 November 2013, https://graduateinstitute.ch/sites/default/files/2019-02/Report_6thHLS_v5_web.pdf (19.12.2019)
- WHO (2019): Trade, foreign policy, diplomacy and health. Website, https://www.who.int/trade/diplomacy/en/ (19.12.2019)
- Katja Mayer, Open Science Diplomacy to tackle the COVID-19 pandemic, https://www.s4d4c.eu/open-science-diplomacy-to-tackle-the-covid-19-pandemic/ (17.04.2020)
- Junaid Nabi, The Case for Global Health Diplomacy, https://www.project-syndicate.org/commentary/coronavirus-global-health-diplomacy-three-strategies-by-junaid-nabi-2020-02 (14.02.2020)

5.4 Key characteristics of science diplomacy approaches

International cooperation as well as science diplomacy as a vehicle for interest and expanding influence are the **keys** to successful science diplomacy approaches. We have seen very different approaches in the sections of this module. They are partly predetermined by the historical circumstances and by political currents in individual countries. In part it is also the regions in which the countries are located which determine the sense and purpose of individual science diplomacy measures. For African countries as well as for some countries in Southeast Asia, completely different approaches are needed to solve certain problems than we need in other highly industrialised countries. science diplomacy must therefore adapt to the prevailing conditions in order to be effective and of long-term benefit.

Several S4D4C reports (see also Module 7) and scientific papers show that certain aspects of science diplomacy are always recurring. These include:

1. the **orientation towards global goals** that have been decided upon by many countries and on the basis of international agreements, such as the Agenda 2030 with the SDGs;
2. the cooperation of countries in **international institutions** that have been created specifically for this purpose, or the cooperation of national institutions in global or transnational contexts;
3. the **relevant institutions**, be it diplomatic or scientific, that are existing at the level of the individual countries or are assigned science diplomacy tasks by political institutions or decision makers;
4. a number of countries send scientists to **diplomatic institutions**, form **advisory bodies**, link the work of **scientific think tanks** with the political work of decision-making institutions, etc.

All these approaches make a lot of sense, but they are by no means self-evident. The tenor is not yet that science diplomacy is a suitable means and medium for tackling problems in international policy. For the combination of science and politics, which can be very diverse, a certain conviction and spirit are needed.

The decision making process, which goes from an idea to a concrete approach, has many phases. At the beginning there is good will and a good concept, which is documented and institutionalised by the work of many experts and which has a clear and well thought-out objective.

5.5 Question Time

5.5.1 Brainstorming Questions

These questions are posed for you to reflect individually about the main messages put by our experts in science diplomacy. Please, take some time to think about them.

- Science diplomacy is a practice that is understood in different ways by different professionals or countries. What would it be your definition? Do you think we require a common consensus for its definition among practitioners?

- How would you describe a specific science diplomacy action, such as the establishment of a large research infrastructure in a region traditionally in conflict, with the different conceptual frameworks here presented?

- Are all scientists and diplomats suited to undertake science diplomacy actions or do they require special training?

- There is no one size that fits all. Science diplomacy institutionalised positions vary between countries. Could you reflect on how your country structures their science diplomacy responsibilities between or within any of their scientific or foreign-affairs governmental departments?

Let's see how much you've learnt – Quiz Time: What Is Science Diplomacy?

Please, take this quiz to evaluate how much you have learnt. You need to get 8 questions right out of 10 in order to move to the next module. You can take the quiz as many times as needed.

We recommend you to read carefully the question to learn exactly what answer you need to select (the right or the wrong one, for example).

1. **Which statesman announced various actions in S&T cooperation with Middle East and other regions of the world in 2009?**
    a. Nicolas Sarkozy
    b. Benjamin Netanyahu
    c. Donald Trump
    d. Barack Obama

2. ***True or false?*** **A good science diplomacy strategy can be set up disregarding historical, socio-cultural etc. backgrounds of the partner.**
    - True
    - False

3. **Which institution is closely working together with other countries and is thus considered a flagship initiative for Science Diplomacy?**

a. The International Space Station
b. The Confucius institute
c. The Goethe Institutes
d. The Institut Français

4. ***True or false?*** **Many of today's standards that apply to the intermeshing of science and diplomacy can be traced back to US initiatives.**
   - True
   - False

5. **Which country appointed its first Science Advisor to the Minister of Foreign Affairs in 2015?**
   a. Japan
   b. Germany
   c. France
   d. Spain

6. **What is most important to establish long-term food security in Africa?**
   a. Increase food imports
   b. Promote innovation
   c. Introduce referendums
   d. Enhance development aid

7. **Which state-run foundation started a Science Diplomatic Network in 2012 and strongly supports SD work?**
   a. Alexander von Humboldt Foundation
   b. Bill Gates Foundation
   c. Institut Français
   d. Spanish Foundation for Science and Technology

8. **Which purpose(s) do national science diplomacy strategies NOT serve explicitly?**
   a. Attract talent to the country
   b. Engage in innovation to tackle global challenges
   c. Build trust
   d. Increase a country's GDP

9. **Which of the following is a major challenge in protecting global health?**
   a. Lack of joint actions and international common agreement
   b. A global reluctance to vaccination
   c. Medication embargos
   d. All of them

10. **Which of the following is a flagship initiative for Science Diplomacy?**
    a. The introduction of the EU Stability and Growth Pact
    b. The initiation of the Marshall Plan
    c. The fight against the Zika Virus
    d. The creation of the North-Atlantic Treaty Organization

Quiz Solution

1D

2 False

3A

4 True

5A

6B

7D

8D

9D

10C